providing a semiconductor layer of a first conductivity type and being lightly doped;

forming a first deep well of a second conductivity type in a first portion of the semiconductor layer;

forming a second deep well of the second conductivity type in a second portion of the semiconductor layer;

forming a first body region of the first conductivity type in the first deep well, the first body region being a gate region of a junction field effect transistor (JFET) device;

forming a second body region of the first conductivity type in the second deep well, the second body region forming a channel of a double-diffused metal-oxide-semiconductor (LDMOS) transistor, wherein the second body region is formed to optimize a threshold voltage and a breakdown voltage of the LDMOS transistor and the first and second body regions have the same doping concentration and depth;

forming a first deep diffusion region in the first deep well under the first body region and in electrical contact with the first body region, the first deep diffusion region together with the first body region establishing a pinch off voltage of the JFET device; and

forming a second deep diffusion region in the second deep well under the second body region and in electrical contact with the second body region, the second deep diffusion region forming a reduced surface field (RESURF) structure in the LDMOS transistor.

13. The method of claim **12**, further comprising:

forming source and drain regions of the second conductivity type on opposite sides of the gate region in the first portion of the semiconductor layer, a channel of the JFET device being formed in an area of the first deep well between the source region and the drain region outside of the gate region.

14. The method of claim **12**, further comprising:

forming a gate electrode, a source region, a drain drift region and a drain region in the second portion of the semiconductor layer, a channel of the LDMOS transistor being formed in the second body region between the source region and the drain drift region, the drain region comprising a first well of the second conductivity type.

15. The method of claim **12**, wherein forming the first body region and forming the second body region comprises:

forming the first body region and the second body region using the same processing steps including the same implant dose and the same implant energy, the implant dose and the implant energy being selected to optimize a threshold voltage and a breakdown voltage of the LDMOS transistor.

16. The method of claim **12**, wherein forming the first deep diffusion region and forming the second deep diffusion region comprises:

forming the first and second deep diffusion regions using the same processing steps and have the same doping concentration and depth, the first and second deep diffusion regions being more heavily doped than the first and second body regions.

17. The method of claim **16**, wherein forming the first deep diffusion region and forming the second deep diffusion region comprises:

forming the first and second deep diffusion regions to have a graded doping profile, the doping concentration decreasing from a first edge near the respective body region to a second edge away from the respective body region.

18. The method of claim **17**, wherein forming the first and second deep diffusion regions to have a graded doping profile comprises:

performing a first ion implantation of dopants of the first conductivity type through a first mask defining the first and second deep diffusion regions and using a first implant dose and a first implant energy; and

performing a second ion implantation of dopants of the first conductivity type through the first mask and using a second implant dose and a second implant energy, the second implant energy greater than the first implant energy.

19. The method of claim **12**, wherein forming the first deep diffusion region comprises:

forming the first deep diffusion region to have a width that is coincidence with the first body region or extends beyond the first body region on both sides of the first body region.

20. The method of claim **19**, wherein forming the first deep diffusion region comprises:

forming the first deep diffusion region that is spaced apart from the drain region by a first distance and is spaced apart from the source region by a second distance, the first distance being greater than the second distance.

21. The method of claim **12**, wherein forming the second deep diffusion region comprises:

forming the second deep diffusion region to have a width that is coincidence with the second body region or extends beyond the second body region towards the drain drift region or extends under the drain drift region.

22. The method of claim **12**, wherein the first conductivity type is P-type and the second conductivity type is N-type.

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